Global climate policy debate comes to a boil

Mark T. Hoske
News Editor

International discussions on limiting carbon-dioxide (CO_2) emissions may peak at a June United Nations-sponsored meeting in Rio de Janiero. So far U.S. policy has been to resist formal limits on CO_2, but international pressures, certain climate studies, and public opinion may be influencing policymakers. Global emissions-trading has been discussed at U.N. meetings.

Estimates for the costs or benefits of controls range widely, from more than $90 billion in 2000 (to cut under 1990 emission levels) to creating net savings through economic stimulus.

Utility impacts of carbon-dioxide emission limits could be immense.

If an international agreement results from the meeting, possible impact to utilities might include incentives for added efficiency measures and non-fossil power generation, disincentives for fossil-fired generation, possible CO_2 monitoring, or controls. Such measures could spur or dampen the economy, depending on who's guessing.

Environmental concerns have prompted several states to impose carbon-dioxide emission penalties on fossil-fired generation within integrated resource planning. Clean-coal technology proponents say new coal technologies are more efficient and should be encouraged.

DOE study discourages cap

Dramatic reductions in CO_2 emissions could severely impact the economy from substantially increased taxes on gasoline and other fuels, according to the U.S. Department of Energy.

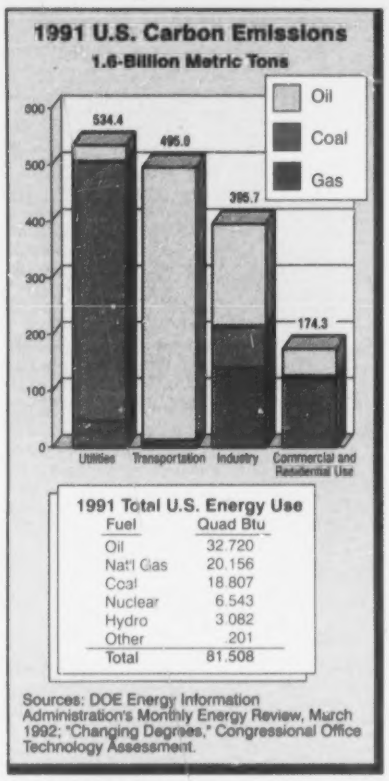
A DOE study, "Limiting Net Greenhouse Gas Emissions in the United States," says capping CO_2 emissions at 20 percent under 1990 levels would cost $95 billion a year by 2000.

U.S. Secretary of Energy James D. Watkins said, "Given these high costs, given the uncertain state of our knowledge about how greenhouse gases affect global climate change, and given the limited effect that action by any one nation can have on global greenhouse gas emissions, arbitrary emission reduction targets such as those studied here are clearly unwarranted," Watkins said.

Ned Helme, Center for Clean Air Policy, said some of the CO_2-control discussions at the United Nations prior to Rio conference were promising.

"The U.S. is moving a lot closer to a treaty than might be apparent at first glance," Helme said, in a March meeting of state regulators.

Helme characterized a carbon cap as something utilities could live with in cost-effective ways until technology catches up with expectations.



U.S. carbon emissions rose to 1.6 billion metric tons, up from 1.4 billion metric tons in 1987, a 14-percent increase. Combustion of fossil fuels release carbon dioxide, a so-called "greenhouse" gas. The inset shows non-carbon-producing source of energy and contribution to energy use. "Other"—wood, wind, waste, solar—would have to expand 90-fold to match coal. (Totals, above, may not add, due to rounding. The analysis uses the following conversions, in carbon/mmBtu: coal 57.5 lb, oil 45 lb, natural gas 32 lb.)

Policy issues include

Among the plethora of related global-climate policy questions are:

- Will the U.S. consent to a firm limit or voluntary target for suspected greenhouse-gas emissions?
- Will President Bush attend the summit, formally called the U.N. Conference of Environment and Development? As many as 180 heads of state may attend. One of the conference goals is to promote sustained global growth and minimize human environmental impacts. Detractors call it a platform for developing nations to seek added economic and development aid.
- Would the brunt of voluntary or mandated U.S. controls hit central-station sources, like utilities, or be split fairly among sectors, especially oil for transportation?
- And if the U.S. decides to implement controls, voluntary or not, would they be command-and-control, carbon taxes, an emission trading system, or a combination?

Petroleum is the greatest contributor by fuel to U.S. 1991 carbon emissions, at a total of 736 metric tons (see chart above). Oil's contribution for transportation at 482 metric tons topped utilities' use of coal at 461 metric tons. Utilities point out that electricity can displace less efficient or environmentally attractive forms of energy use.

Renewable resources contribute a tiny percentage to overall energy use, compared to oil, showing how difficult a significant replacement strategy might be. Using electric vehicles could allow more efficient use of existing generating resources, perhaps displacing oil, with baseload nuclear power. Natural gas has a lower carbon content than other fossil fuels and is expected to contribute more in generation and transportation sectors.

Plant trees, collect CFCs, cut CO_2

Planting trees, grasses, or other store-houses for carbon might be one way for many utilities to comply with a cap, said Helm.

American Electric Power, one of the largest U.S. users of coal for electric power, produces 5 percent of U.S. utility CO_2, or 1.5 percent of the total U.S. contribution. Costs of capping AEP's 1.1-percent growth rate could amount to $1.6 billion by 2015, or 20 percent of AEP's revenue requirement. Tree planting could cut cap costs to just 2 percent, by far the cheapest compliance method, Helme explained. "This can buy a significant 30-year transition period," Helme said.

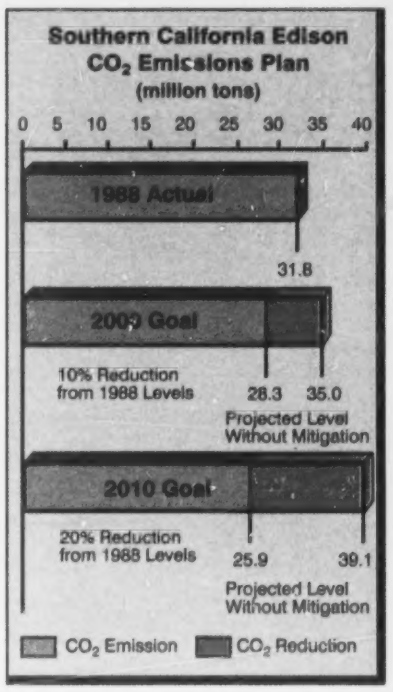
Recent tree planting efforts at other utilities include Union Electric (see photo) and Los Angeles Department of Water and Power. LADWP is part of a plan to plant 50,000 seedlings a year.

UE's tree planting "GreenLeaf" program, awarded cities in its territory 17 grants worth more than $23,000 in 1991. The program, started in 1989, funded the reforestation of parts of cities, such as St. Louis.

Research indicates that, in addition to storing carbon, city foliage can help reduce the urban "heat islands" that raises temperature of cities 2-8°F in summer afternoons. Environmental Protection Agency says this effect has raised temperatures in LA, Washington, DC, and Baltimore by 4-5°F over a century ago.

California, among the strictest U.S. emission-control areas, has two utilities volunteering to cut CO_2 by 20 percent by 2010.

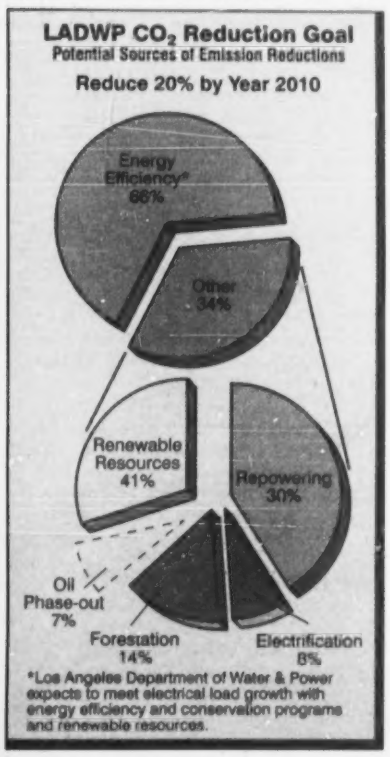
The May 1991 plans, from Southern California Edison and LADWP, include some efforts by others within their service territories (see graphics).

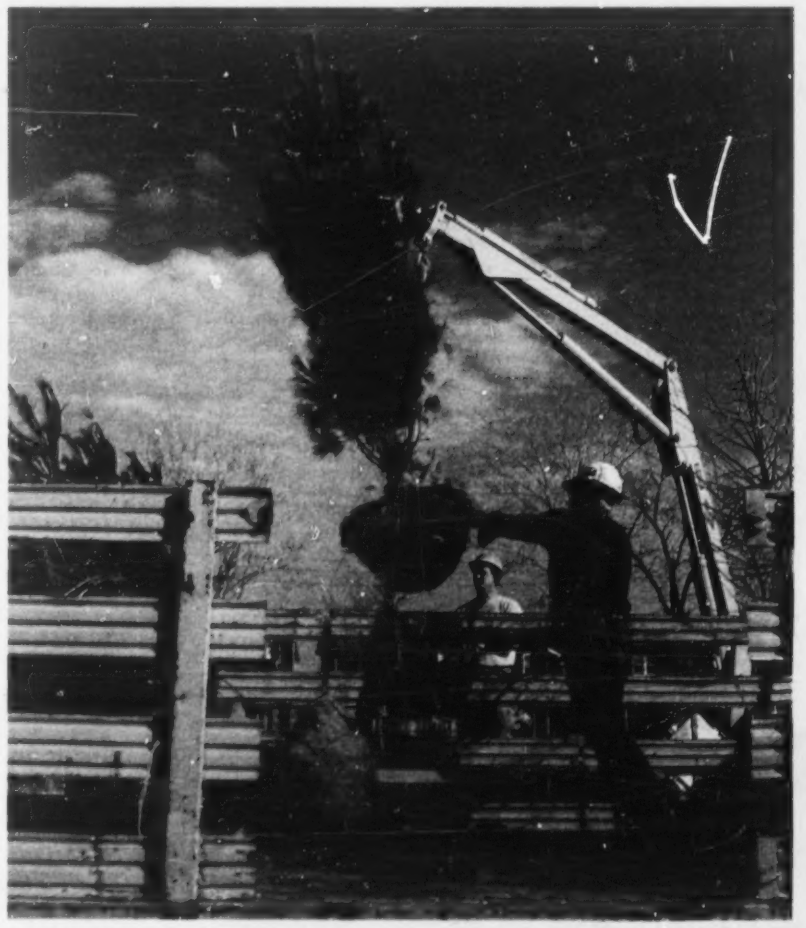


Offset strategies

New England Electric System's strategic plan follows National Academy of Sciences recommendations for cutting greenhouse gases. These include looking into offset strategies such as tree planting, chlorofluorocarbon recycling from appliances, methane recovery at coal mines, use of coal ash for concrete, and enhancement of marine algae growth to absorb CO_2. NEES will start pilot renewable generation projects.

"With this plan," said Doug Foy, of the Conservation Law Foundation environmental group in Boston, NEES "issued a serious response to greenhouse concerns."


LADWP CO_2 Reduction Goal
Potential Sources of Emission Reductions
Reduce 20% by Year 2010
Energy Efficiency* 66%
Other 34%
Renewable Resources 41%
Repowering 30%
Oil Phase-out 7%
Forestation 14%
Electrification 8%
*Los Angeles Department of Water & Power expects to meet electrical load growth with energy efficiency and conservation programs and renewable resources.



Union Electric tree planting program helps cool city neighborhoods like Trinity Square in St. Louis.

GAO says utilities must continue storing nuclear wastes onsite

WASHINGTON—Most states expect to manage their low-level wastes after Jan. 1, 1993, by having electric utilities with nuclear plants and other producers of low-level radioactive wastes store them onsite until state-sponsored disposal facilities are ready.

This is because the states have not responded well to their mandated responsibilities for storing low-level waste from nuclear facilities, said the General Accounting Office in a recent report. The GAO's report, 'Nuclear Waste: Slow Progress Developing Low-Level Radioactive Waste Disposal Facilities," noted that the governments' responsibilities were spelled out in Congress' Low-Level Radioactive Waste Policy Act of 1980.

Now, of the 13 states planning to develop new disposal facilities, most have made progress, said GAO. But only one, California, is expected to have its facility operating by the time those states with existing facilities can deny access to waste generators in other states.

In addition, most of the other 12 states were not scheduled to have their facilities ready until 1996, or later.

The report also enumerates problems encountered since the states—either individually or through groups called "compacts"—were made responsible for the waste generated within their own borders. The study discusses:

- The states' progress and problems in meeting facility development milestones in the law.
- Federal and state efforts to resolve issues related to mixed waste and waste with low levels of radioactivity.
- The Dept. of Energy's progress in discharging the federal government's responsibility under the law to manage the most hazardous low-level waste.

Because of the slow movements the states were making, in 1986 Congress extended the deadline for them to build new disposal facilities from the original date set of Jan. 1, 1986, to a new date of Jan. 1, 1993.

The states blamed the complex process involved in siting and building the repositories for the delays. As an example, state officials described the efforts to involve the public and the resulting public opposition that had to be taken into account in their efforts and time schedules. This opposition has been especially evident during the selection process for potential sites.

Confined-Zone Dispersion cuts SO_2 emissions in half

WASHINGTON—Preliminary test results for the Confined Zone Dispersion (CZD) process indicate it could be an effective, near-term option for utilities to use to clean up SO_2 emissions from older, coal-burning power plants.

Under the Department of Energy's Clean Coal Technology (CCT) program, the initial results from commercial-scale test of this sorbent injection process met or exceeded its goal of a 50-percent reduction in SO_2 emissions. The tests were performed on Pennsylvania Electric Co.'s 74-MW Unit 15 at its Seward Station near Johnstown, PA.

According to DOE, the results increase the likelihood that the pollution control technique will be ready for commercial deployment at older power plants or those with little space to spare in time to meet the 1995 SO_2 emission reduction requirements of the Clean Air Amendments Act of 1990.

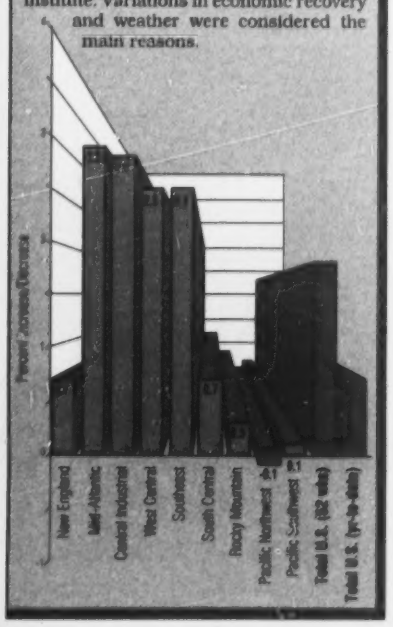
While not able to achieve the 90-95-percent sulfur removal efficiencies of scrubbers, sorbent injection systems are less expensive to build and operate. Based on data developed by the CCT project, the cost of retrofitting a power plant to utilize CZD technology would be about $25/kW. Operating costs are projected at less than 3 mills/kWh.

Process wastes are dry and relatively easy to handle. No further treatment is needed for their disposal.

Retrofitting at the Seward plant with the Bechtel Corp.-developed process began in March 1991 and was completed four months later. One of the plant's ducts was replaced with a 110-ft straight duct to provide sufficient residence time for the CZD lime slurry to capture the flue gas SO_2.

ELECTRIC OUTPUT
Growth Mixed

Changes in net electric output from the Mainland U.S. electric utilities continued to vary widely for the 52 weeks ending March 21, as reported by Edison Electric Institute. Variations in economic recovery and weather were considered the main reasons.



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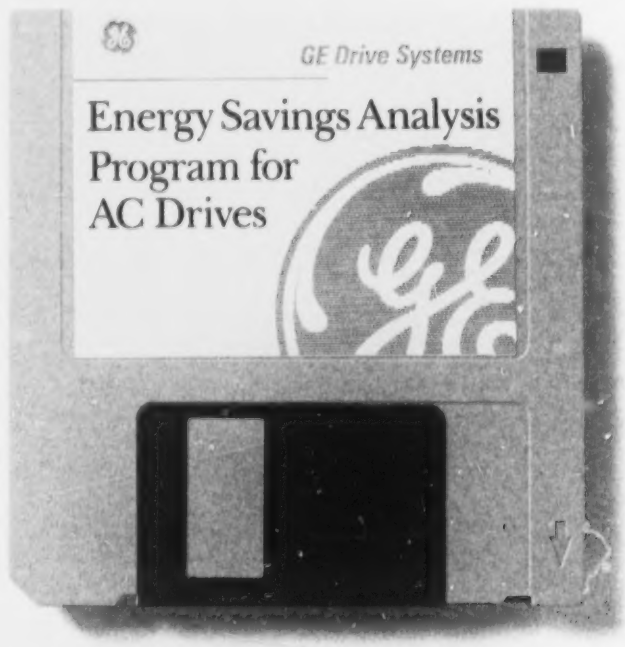

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VOICE OF THE ELECTRIC UTILITY INDUSTRY

LATE NEWS

Advanced Battery Consortium picked a nickle-metal hydride battery for electric vehicles (p.16).
The House dropped global warming provisions from its energy bill.
Utilities refigure fuel planning to take advantage of the FERC's Rule 636, which restructures the natural gas industry.
Tennessee Valley Authority's Marvin Runyon will be postmaster general in July. He streamlined TVA, cut employees by 40 percent, and pushed nuclear power. No replacement was named.

WPL sells first sulfur dioxide credits

Bob Smock, Editorial Director
Mark Hoske, News Editor

MADISON, WI—Wisconsin Power & Light President Erroll Davis announced that his company has sold 10,000 sulfur dioxide allowances to Tennessee Valley Authority and from 10,000 to 25,000 more to Duquesne Light Co.

Davis called the transactions the first publicly announced allowance sales under provisions of the Clean Air Act Amendments of 1990.

He did not reveal the price but said allowances are currently trading in the range of $250 to $400 per allowance. WPL expects to ultimately sell from 80,000 to 120,000 allowances, said Davis at a May 12 press conference here.

(At $325 per credit, transactions totalling 27,500 allowances would amount to more than $8.9 million.)

"This is a competitive marketplace and I don't want to divulge too much about our marketing strategy," he explained. The TVA sale was arranged through a broker, Davis added, and the Duquesne Light Co. sale was negotiated by the two utilities. "Market prices," Davis said, "are based on the buyer's and seller's perceptions of value."

Wisconsin Power & Light is able to sell allowances because stringent state environmental regulations have reduced emissions from the utility's three Phase-1-affected generating units to levels well below their allowances. Those coal-fired units are the 330-MW Edgewater 4 with 24,750 allowances, the 110-MW Nelson Dewey 1 with 6010 allowances, and Nelson Dewey 2 with 6680 allowances.

"Emission credits to burn"

"We have emission credits to burn in this state," said C. D. Besadny, secretary of Wisconsin' Department of Natural Resources at the press conference announcing the sale.

WPL's Davis said, "We are selling timing. These allowances will allow companies to come into compliance in the most cost-effective way."

Davis noted that the allowances will be delivered in 1995 and that they have no expiration date. Asked why he was willing to be the first to announce a sale, Davis said, "We are not hesitant to make the market."

Regulatory treatment, market future

In a later telephone interview Davis explained further, "We're making the market with this transaction. TVA hopes the price goes way up. I hope it goes way down."

Asked about potential regulatory treatment, WPL's Davis said, "The chairman of the Wisconsin Public Service Commission spoke glowingly, no, better make that positively, about emissions trading." Asked whether that praise assured positive regulatory treatment, Davis noted that all utility transactions are subject to regulatory scrutiny.

No determination has been made on who will get the benefits of the transaction, but Davis said customers would be the primary beneficiaries.

TVA sees allowances as insurance

TVA's William Malec, senior vice president for finance, said that TVA plans to use the allowances around the turn of the century. He said that TVA's current SO_2 emissions are about 1.2-million tons. Those emissions will decline to 800,000 tons after the 1995 Phase 1 deadline and 450,000 tons after the Phase 2 deadline in 2000.

"As allowance purchasers," said Malec, "we have been testing the allowance market for some time." He noted the possibility that TVA may not use the allowances purchased from WPL and may resell them.

Malec said "We're looking at this purchase as insurance" to help if a scrubber is delayed or a major outage occurs. He added, "It helps develop the market for allowance trading and it might help TVA later if we want to buy or sell additional credits."

The 10,000-ton TVA transaction is small for TVA, totalling less than 1 percent of present TVA emissions, Malec pointed out.

TVA has announced that it will install scrubbers on its Cumberland units 1 and 2, 1300 MW each, as part of its Phase 1 compliance strategy which is expected to cost from $750 million to $850 million in capital expenditures. Other units will be brought into compliance via fuel switching.

TVA said it has joined an allowance pooling group formed by utilities that are installing Phase 1 scrubbers. Members in the pool will share in bonus allowances created by installing high-efficiency scrubbers by the 1995 deadline.

Asked if TVA's affiliation with the federal government make it the logical first buyer, Malec said, "This transaction was independent of TVA being a federal agency. Developing an active allowance market will permit the lowest possible cost of compliance for all U.S. utilities."

WPL has more to sell

What advice would WPL offer for other utilities looking to join the market?

"We'd entertain calls," said Davis, suggesting that WPL has more allowances to sell. He wouldn't say if other transactions were pending, however.

"If we strike a deal and the other party wants to make the transaction public, then we'll do so. That's what I like about this new competitive market. We don't have to tell as much," Davis said.

"I wouldn't want to give away confidential information," he laughed.

WPL Holdings is the Madison, WI-based parent company of WPL. DQE Inc., based in Pittsburgh, PA, owns Duquesne Light.

Carbon caps lose favor

WASHINGTON—In preparation for the United Nations-sponsored Earth Summit in June, 143 nations reached nonbinding agreement for limiting emissions thought to contribute to global warming. The target is for major, developed nations to limit suspected emissions, including carbon-dioxide, to 1990 levels.

As a result of the non-binding nature of the agreement, President George Bush said he would go to the UN meeting in Rio de Janeiro.

The Rio meeting, June 3-14, may be the largest-ever gathering of world leaders, with more than 100 expected to attend. U.S. participation had been in doubt because of previous UN meetings that suggested a mandatory cap was likely (*EL&P*, 5/92, p.17).

House legislation proposes limits

In a separate, but related development, the administration and major utility industry groups condemned House legislation that would cap CO_2 emissions at 1990 levels by 2000, a drop of 19 percent from projected 2000 levels. That bill, sponsored by Rep. Henry Waxman (D-CA), may become part of the House energy bill.

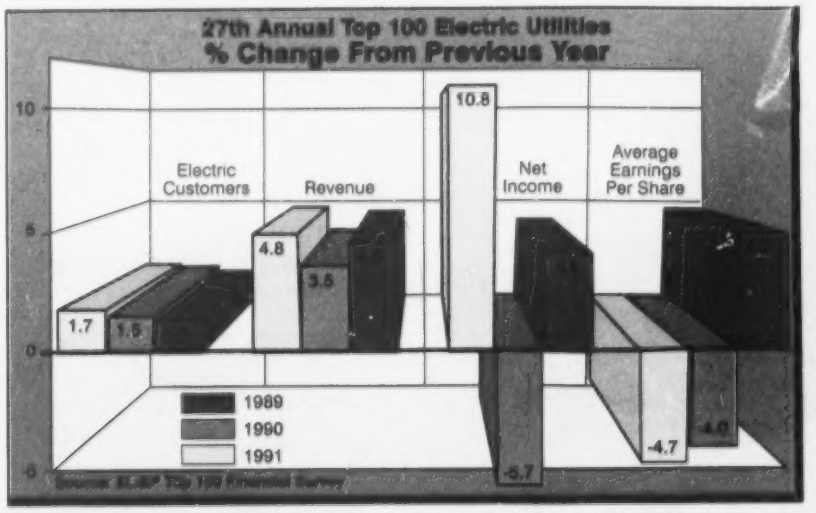
The overall cost of compliance, according to Department of Commerce studies, would be a $92-billion annual reduction in U.S. gross national product and cost more than 500,000 jobs by 2000. Bush threatened to veto U.S. energy legislation containing such provisions.

The Edison Electric Institute, American Public Power Association and National Rural Electric Cooperative Association have spoken against mandatory CO_2 emission cuts.

An administration report released in April titled, "U.S. Views on Global Climate Change," says, in-part that the administration's National Energy Strategy would cut emissions 7-11 percent by 2000, using efficiency and technology advances and avoiding command-and-control measures. Many NES provisions are in pending energy legislation.

Sources from the House and Senate indicate the energy bills could be in conference committee by June, and passed before the August recess.

The administration, in global-climate discussions, has sought flexibility in reductions without capping emissions as some other industrial nations favored. The U.S. contends that flexible guidelines and technology can limit emissions and promote growth, while



Top 100 Financial results suggest an industry turnaround. See the full report starting on page 13.

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DOE issues solicitation for fifth Clean Coal Technology round

WASHINGTON—The Department of Energy sent out Solicitation No. DE-PS01-92FE62647, Draft Program Opportunity Notice for Clean Coal Technology V (CCT V) in late April to more than 3000 individuals who had expressed interest in the CCT program. The closing date for submitting proposals for demonstration projects for CCT V cost sharing by DOE is Dec. 7.

This draft not only asks for proposals for projects, it also asks for comments on the draft itself. Comments must be submitted before the final Program Opportunity Notice is released by July 6.

The draft notice contains detailed information on criteria to be used in evaluating proposed projects, along with submittal instructions.

About $568 million has been allotted by DOE to fund CCCT V projects in this final scheduled round of competition.

DOE is looking for proposals that "advance significantly the efficiency and environmental performance of coal using technologies that are applicable to either new or existing facilities." Only proposals that satisfy qualification criteria and preliminary evaluation will be considered for "comprehensive" evaluation for the CCT program.

Proposals must remain valid for a period of acceptance of at least 365 days from Dec. 7. DOE expects to complete evaluation and selection of proposals within five months after submission, or by May 6, 1993.

All communications with DOE about the solicitation should cite the draft proposal number and be addressed to: U.S. Dept. of Energy, Office of Placement & Administration, Office of Management Support, Forrestal Bldg., Rm 1J-005, 1000 Independence Ave., SW, Washington, DC, 20585, Attn: Document Control Specialist (PR-33). For more immediate information about the solicitation, call: Herbert T. Watkins at DOE at 202/586-1026.

The first four CCT solicitations were issued in 1986, 1988, 1989, and 1991. As of early May, 42 projects were active in the program, with 15 of them completed or in operation.

Water won't upwell into Yucca repository

WASHINGTON—The National Academy of Sciences' National Research Council (NAS/NRC) declared in mid-April that the proposed high-level radioactive waste depository was not at risk for groundwater infiltration. The findings are contrary to those presented in a 1989 report by a Department of Energy staff scientist.

The NAS/NRC report, "Ground Water at Yucca Mountain: How High Can It Rise?" was written by a 17-member panel after a two-year study. The panel concluded that the evidence of groundwater upswelling in and around Yucca Mountain could not be reasonably attributed to coupled hydrologic/tectonic hydrothermal systems. In other words, groundwater had not percolated up into the proposed facility from below and would not in the future. It dismissed the opposite view put forth by DOE geologist Jerry Szymanski.

Headed by C. Barry Raleigh, dean of the University of Hawaii School of Ocean & Earth Sciences and Technology, the NAS/NRC group focused on whether calcite veins in the mountain were deposited by water from below or by rainwater. The panel report says, "In fact, the evidence strongly supports a surface-process origin from rainwater for the vein and surface parallel carbonate and carbonate silica deposits throughout the Yucca Mountain area."

The council panel also ruled as negligible the chances of volcanic activity or an earthquake seriously raising the underlying water table.

Why it's so important

The controversy over the two reports is important because the most likely cause of radioactivity from spent fuel rods contaminating the environment outside the repository will be with water entering the storage space and carrying radionuclides into the groundwater system. Such water would have to come up from below, since rainwater is easily blocked from entering the space.

DOE Secretary James D. Watkins praised the panel for their thoroughness and objectivity.

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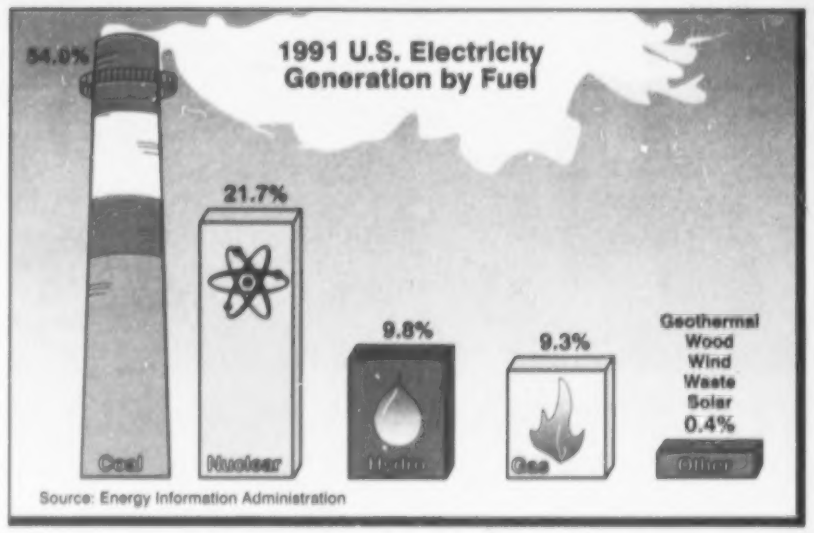

Electric utility performance improves

Numbers from several sources point to improved performances in the electric utility industry for 1991.

Most nuclear generation performance indicators and total generation and sales improved, while prices fell. Many areas of performance for leading investor-owned utilities also improved (p.13).

Nuclear performance improves

The Institute of Nuclear Power Operations (INPO) showed that unit capability factor improved 4 percent from 1990-91 to 75.7 percent, the largest gain since INPO started record keeping in 1980. The 1995 goal is 80 percent.

Low-level waste from nuclear plants exceeded a 1995 goal in 1991, 243 cubic meters for BWRs and 85 cubic meters for PWRs.

Although 1991 thermal heat rate increased slightly in 1991 to 10,220 Btu/kWhr, from 10,218, the 1990 goal was 10,260, which has been met since 1988.

The number of unplanned automatic scrams, the amount of collective radiation exposure, and safety system performance all improved.

Electric sales

According to the DOE's Energy Information Administration, in 1991:

- Electric sales increased 2 percent to 228 billion kWh.
- Total net generation increased an estimated 0.5 percent to 2,822 billion kWh, compared to 1990.
- Real electric prices fell 2 percent.

Reorganized Siemens Power makes first gas turbine in U.S.

MILWAUKEE—Siemens Power Corp. completed its first gas turbine manufactured in the U.S., one that will be exported to the Taiwan Power Co. The 100-MW V84.2 gas turbine will go into operation in June 1993.

At the rollout on May 6, R. Baird Stephenson, scheduled to be president and CEO of the new Siemens Power Corp., said, "This is a significant achievement for a company that hasn't officially begun operation as a consolidated unit."

Siemens Power is part of the worldwide Siemens Power Generation Group (KWU), which has its headquarters in Erlangen, Germany, and employs more than 400,000 people. Nearly 30,000 of these are in the U.S.

Stephenson, currently still president and CEO of Siemens Nuclear Power Corp., was referring to the consolidation of the entire Siemens KWU U.S. organization, due to take effect officially on Oct. 1, the start of the firm's fiscal year.

The V84.2 turbine uses a hybrid burner design operating in a twin combustion chamber that allows Siemens to guarantee the unit will produce less than 9-ppm NOx emissions and carbon monoxide emissions near the undetectable end of measurement instruments' abilities.

Each burner can operate with either of its built-in diffusion or premix flame nozzles. This hybrid configuration allows the burner to be set in the diffusion burning mode for startup and then switched, when output reaches about 45 percent, to the premix operation for low-NOx emission.

Although U.S. content (parts and labor) of this first gas turbine was only 30 percent, Hans Boehm, head of Siemens Fossil Power Generation, assured listeners at a special meeting the next day at the West Allis, WI, A-C Equipment Services plant that this amount would be raised to 60-70 percent as quickly as feasible.

Stephenson stated that he expected the suburban Milwaukee plant to produce 10-12 of the gas turbines per year and begin steam turbine production by the end of '92. To achieve these ends, he noted that parent Siemens Power Generation Group planned to invest $30 million in the facility in the next 2½ years.

On Oct. 1, Siemens fossil and nuclear power generation units will be consolidated into Siemens Power Corp., headquartered in Bellevue, WA, (Nuclear Div.) and Milwaukee (Fossil Div.). The new operating company will provide U.S. customers with a single source for power generation products and services.

Besides absorbing A-C Equipment Services' gas turbine manufacturing and servicing facilities, Siemens Power will be comprised of the combined assets and affiliates of the nuclear fuel development and manufacturing facilities in Bellevue and Richland, WA; nuclear service facilities in Chattanooga, TN; and Fossil Div. sales, marketing, and administration offices in Bradenton, FL. The company also will oversee the Siemens part interests in Rofin-Sinar (laser cutting and welding systems), San Jose, CA, and Siemens Solar Solar Industries, Camarillo, CA. Siemens Power Ventures Inc., New York, will remain as an independent entity.